

227th ECS Meeting



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CHICAGO

May 24-28, 2015

Chicago, Illinois, USA

Hilton Chicago



Call for Papers



227th ECS Meeting

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General Information

The 227th ECS Meeting will be held from May 24-28, 2015. This major international conference offers a unique blend of electrochemical and solid-state science and technology; and serves as a major forum for the discussion of interdisciplinary research from around the world through a variety of formats, such as oral presentations, poster sessions, exhibits, and tutorial sessions.

Abstract Submission and Deadlines

Abstracts are due no later than November 14, 2014.

Note: Some abstracts may be due earlier than November 14, 2014. Please carefully check the symposium listings for any alternate abstract submission deadlines. For complete details on abstract submission and symposium topics, please see www.electrochem.org/meetings/biannual/227/.

Submit one original meeting abstract electronically via the ECS website, no later than **November 14, 2014**. Faxed abstracts, e-mailed abstracts, and late abstracts will not be accepted. In January 2015, all authors will receive an e-mail notifying them of the date, time, and location of their presentation. Meeting abstracts should explicitly state objectives, new results, and conclusions or significance of the work. Regardless of whether you submit as a poster or an oral presentation, it is at the symposium organizers' discretion whether it is scheduled for an oral or poster presentation. Programming for this meeting will occur in January 2015.

Paper Presentation

All authors selected for either oral or poster presentations will be notified in January 2015. Oral presentations must be in English. Both LCD projectors and laptops will be provided for oral presentations. **Presenting authors MUST bring their presentation on a USB flash drive to be used with the laptop that will be provided in each technical session room.** If a presenting author would like to use his/her own laptop for presentation, we strongly suggest that the author verify laptop/projector compatibility in the presentation room prior to the start of the session or all other presentations. Speakers requiring additional equipment must make written request to the ECS headquarters office at least one month prior to the meeting and appropriate arrangements will be worked out, subject to availability, and at the expense of the author. Poster presentations should be displayed in English, on a board approximately 3 feet 10 inches high by 3 feet 10 inches wide (1.17 meters high by 1.17 meters wide), corresponding to the abstract number and day of presentation in the final program.

Manuscript Publication

ECS Meeting Abstracts—All meeting abstracts will be published on the ECS website, copyrighted by ECS, and all abstracts become the property of ECS upon presentation.

ECS Transactions—All full papers and posters presented at ECS meetings are eligible for submission to the online proceedings publication, *ECS Transactions* (ECST). The degree of review to be given each paper is at the discretion of the symposium organizers.

Some symposia will publish an "enhanced" issue of ECST, which will be available for sale at the meeting and through the ECS Digital Library. Please see each individual symposium listing in the full Call for Papers to determine if there will be an "enhanced" ECST issue. In the case of symposia publishing "enhanced" issues, submission of a full-text manuscript to ECST is mandatory and required in advance of the meeting.

Some symposia will publish a "standard" issue of ECST for which all authors are encouraged to submit their full-text papers. Please see each individual symposium listing in the full Call for Papers to determine if there will be a "standard" ECST issue. Upon completion of the review process, papers from the "standard" issues will be published shortly after their acceptance. Once published, papers will be available for sale through the ECS Digital Library.

Please visit the ECST website (ecsdl.org/ECST/) for additional information, including overall guidelines, deadlines for submissions and reviews, author and editor instructions, a manuscript template, and more.

Authors presenting papers at ECS meetings, and submitting to ECST, are also encouraged to submit to the Society's technical journals: the *Journal of the Electrochemical Society*, *ECS Journal of Solid State Science and Technology*, *ECS Electrochemistry Letters*, or *ECS Solid State Letters*. Although there is no hard deadline for the submission of these papers, it is considered that six

months from the date of the symposium is sufficient time to revise a paper to meet the stricter criteria of the journals. "Instructions to Authors" are available from the ECS website.

If publication is desired elsewhere after presentation, written permission from ECS is required.

Financial Assistance

Financial assistance is very limited and generally governed by the symposium organizers. Individuals may inquire directly to the organizers of the symposium in which they are presenting their paper to see if funding is available.

For details regarding Division-sponsored travel grants for young professionals and students, please see: http://www.electrochem.org/sponsorship/travel_grants.htm

Letter of Invitation

Individuals requiring an official letter of invitation should write to the ECS headquarters office; such letters will not imply any financial responsibility of ECS.

Hotel Reservations — Deadline April 24, 2015

The 227th ECS Meeting will be held at the Hilton Chicago, 720 South Michigan Avenue, Chicago, Illinois, 60605, USA. Please refer to the meeting website for the most up-to-date information on hotel availability and information about the block of rooms where special rates have been reserved for participants attending the meeting. **The hotel reservation deadline is April 24, 2015.**

Meeting Registration

All participants—including authors and invited speakers—are required to pay the appropriate registration fees. Hotel and meeting registration information will be posted on the ECS website as it becomes available. **The deadline for discounted early-bird registration is April 24, 2015.**

Short Courses

A number of short courses will be offered on Sunday, May 24, 2015 from 9:00 AM-4:30 PM. Short Courses require advance registration and may be cancelled if enrollments are too low. As of press time, the following Short Courses are planned for the meeting: Electrochemical Impedance Spectroscopy and Fundamentals of Electrochemistry. Please check the ECS website for the final list of offerings.

Technical Exhibit

The 227th ECS Meeting in Chicago will include a Technical Exhibit, featuring presentations and displays by over 40 manufacturers of instruments, materials, systems, publications, and software of interest to meeting attendees. Coffee breaks are scheduled in the exhibit hall along with evening poster sessions.

Sponsorship Opportunities

ECS biannual meetings offer a wonderful opportunity to market your organization through sponsorship. Sponsorship opportunities include unparalleled benefits and provide an extraordinary chance to present scientific products and services to key constituents from around the world. Sponsorship allows exposure to key industry decision makers, the development of collaborative partnerships, and potential business leads. ECS welcomes support in the form of general sponsorship at various levels: Platinum: \$10,000+, Gold: \$5,000, Silver: \$3,000, and Bronze: \$1,500.

Sponsors will be recognized by level in *Interface*, the Meeting Program, meeting signage, on the ECS website, and in the mobile app. In addition, sponsorships are available for the plenary and keynote talks and other special events. These opportunities include additional recognition, and may be customized to create personalized packages. Special event sponsorships will be assigned by the Society on a first-come, first served basis. Advertising opportunities—in the Meeting Program as well as in *Interface*—are also available. Please contact Christie Knef at 1.609.737.1902, ext. 121 for further details.

Contact Information

If you have any questions or require additional information, contact ECS, 65 South Main Street, Pennington, New Jersey, 08534-2839, USA, tel: 1.609.737.1902, fax: 1.609.737.2743, e-mail: meetings@electrochem.org; Web: www.electrochem.org.



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Symposium Topics

A — Batteries and Energy Storage

- A01 — Joint General Session: Batteries and Energy Storage –and– Fuel Cells, Electrolyzers, and Energy Conversion
- A02 — Lithium-Ion Batteries and Beyond
- A03 — Stationary and Large Scale Electrical Energy Storage Systems 5

B — Carbon Nanostructures and Devices

- B01 — Carbon Nanostructures for Energy Conversion
- B02 — Carbon Nanostructures in Medicine and Biology
- B03 — Carbon Nanotubes - From Fundamentals to Devices
- B04 — Endofullerenes and Carbon Nanocapsules
- B05 — Fullerenes - Chemical Functionalization, Electron Transfer, and Theory: In Honor of Professor Shunichi Fukuzumi
- B06 — Graphene and Beyond - 2D Materials
- B07 — Inorganic/Organic Nanohybrids for Energy Conversion
- B08 — Porphyrins, Phthalocyanines, and Supramolecular Assemblies

C — Corrosion Science and Technology

- C01 — Corrosion General Session
- C02 — High Temperature Corrosion and Materials Chemistry 11

D — Dielectric Science and Materials

- D01 — Dielectrics for Interconnects, Interposers, and Packaging 2

E — Electrochemical/Electroless Deposition

- E01 — Metallization of Flexible Electronics
- E02 — Surfactant and Additive Effects on Thin Film Deposition, Dissolution, and Particle Growth

F — Electrochemical Engineering

- F01 — Alkaline Electrolyzers
- F02 — Electrochemical Engineering General Session
- F03 — Electrochemistry in Mineral and Metal Processing
- F04 — High Rate Metal Dissolution Processes 2

G — Electronic Materials and Processing

- G01 — Organic Semiconductor Materials, Devices, and Processing 5
- G02 — Processes at the Semiconductor Solution Interface 6

H — Electronic and Photonic Devices and Systems

- H01 — Advanced CMOS-compatible Semiconductor Devices 17
- H02 — Emerging Materials for Post CMOS Devices and Applications 7
- H03 — Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits and Emerging Applications 5
- H04 — State-of-the-Art Program on Compound Semiconductors 57 (SOTAPOCS 57)
- H05 — Wide Bandgap Semiconductor Materials and Devices 16

I — Fuel Cells, Electrolyzers, and Energy Conversion

- I01 — Crosscutting Metrics and Benchmarking of Transformational Low-Carbon Energy-Conversion Technologies
- I02 — Electrochemical Synthesis of Fuels 3
- I03 — Materials for Low Temperature Electrochemical Systems 2
- I04 — Methane-Based Electrochemical Energy Conversion and Storage
- I05 — Solid-Gas Electrochemical Interfaces (SGEI 1)
- I06 — State-of-the-Art Tutorial on Diagnostics in Low Temperature Fuel Cells

K — Organic and Bioelectrochemistry

- K01 — Mechanistic Organic Electrochemistry
- K02 — Students in Bioelectrochemistry
- K03 — Timely Challenges in Electroanalysis

L — Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry

- L01 — Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session
- L02 — Climate Change 5
- L03 — Computational Electrochemistry
- L04 — Electrocatalysis 7
- L05 — Electrochemistry at Primarily Undergraduate Institutions
- L06 — Electrochromic and Chromogenic Materials
- L07 — Electrogenated Chemiluminescence
- L08 — Spectroelectrochemistry 3
- L09 — Oxygen or Hydrogen Evolution Catalysts for Water Electrolysis
- L10 — Photocatalysts, Photoelectrochemical Cells, and Solar Fuels 5
- L11 — Structure and Relaxations in Soft Ion-conducting Materials

M — Sensors

- M01 — Nano/Biosensors and Actuators
- M02 — Nano-Micro Sensors and Systems in Healthcare and Environmental Monitoring
- M03 — Sensor Applications of Ionic Liquids
- M04 — Sensors, Actuators, and Microsystems General Session (Chemical and Biological Sensors)

Z — General

- Z01 — General Student Poster Session
- Z02 — Nanotechnology General Session
- Z03 — Solid State Topics General Session
- Z04 — Nature-Inspired Electrochemical Systems



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A—Batteries and Energy Storage

A01

Joint General Session: Batteries and Energy Storage - and- Fuel Cells, Electrolytes, and Energy Conversion

Energy Technology Division / Battery Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Papers are solicited on the fundamental and applied aspects of energy storage and energy conversion not covered by other symposia at this meeting. Of particular interest are new materials and designs, performance studies, and modeling of all types of batteries, supercapacitors, and fuel cells including aqueous, non-aqueous, polymer electrolytes, solid electrolytes, and flow systems.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Mani Manivannan**, NETL, email: manivana@netl.doe.gov; **Richard Jow**, Army Research Laboratory, email: t.r.jow.civ@mail.mil; **Kristina Edstrom**, Uppsala University, email: kristina.edstrom@mkem.uu.se; **Vibha Kalra**, Drexel University, email: vk99@drexel.edu; and **Bor Yann Liaw**, University of Hawaii, email: bliaw@hawaii.edu.

A02

Lithium-Ion Batteries and Beyond

Battery Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Lithium ion batteries are the workhorses of portable electronics, power tools, electric drive vehicles, and future energy storage systems. The demands for higher energy and power capability in these applications continue to fuel the research of battery technologies. This symposium welcomes reports on new advancements in concepts, materials, and designs to advance lithium ion battery technology and beyond, including lithium-air, lithium-sulfur, Na-, and Mg-based chemistries. The topics include but are not limited to materials synthesis, electrode processing, modeling and simulation, testing and evaluation, characterization and diagnosis. Other topics on electrolytes, safety issues, and characterization techniques are welcome.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Khalil Amine**, Argonne National Laboratory, email: Amine@anl.gov; **Brett Lucht**, University of Long Island, email: blucht@chm.uri.edu; and **John Muldoon**, Toyota Research Institute North America, email: john.muldoon@tema.toyota.com.

A03

Stationary and Large Scale Electrical Energy Storage Systems 5

Energy Technology Division / Battery Division / Industrial Electrochemistry and Electrochemical Engineering Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Electrical energy storage is critical for supporting the integration of renewable energy generation and increasing the capacity and reliability of the future electricity grid. Electrochemical systems have the potential to fulfill this need. This symposium seeks oral and poster presentations on materials and technology advances, design studies, results of performance demonstrations, and economics studies. The technologies of interest include redox-flow systems, metal-air rechargeable batteries, electrolyzers, capacitors, and other rechargeable electrochemical energy storage systems that have the potential to meet the cost and efficiency requirements of large-scale deployment.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **S. R. Narayan**, USC, email: sri.narayan@usc.edu; **Jean St-Pierre**, Hawaii, email: jsp7@hawaii.edu; **Trung Van Nguyen**, Univ. of Kansas, email: cptvn@ku.edu; and **Sanjeev Mukerjee**, Northeastern, email: S.Mukerjee@neu.edu.

B—Carbon Nanostructures and Devices

B01

Carbon Nanostructures for Energy Conversion

Nanocarbons Division / Battery Division / Energy Technology Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Papers are invited in the following areas related to energy conversion using nanocarbons: synthesis and characterization of relevant nanoparticles and nanostructures; functionalization with chromophores; inducing chemical reactions with strong photon-molecule coupling fields; size- and shape-dependent photocatalytic properties; photochemical solar cells; and photocatalysis and electron transfer studies relevant to energy conversion.



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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Jeff Blackburn**, NREL, email: jeffrey.blackburn@nrel.gov; **Plamen Atanassov**, Univ. New Mexico, email: plamen@unm.edu; **Jie Xiao**, Pacific Northwest National Lab, email: Jie.Xiao@pnl.gov; **Vito Di Noto**, University di Padova, email: vito.dinoto@unpd.it; **Michael Arnold**, University of Wisconsin, email: msarnold@wisc.edu; and **Steven Doorn**, Los Alamos National Laboratory, email: skdoorn@lanl.gov.

B02

Carbon Nanostructures in Medicine and Biology

Nanocarbons Division / Organic and Biological Electrochemistry Division / Physical and Analytical Electrochemistry Division / Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Original papers are solicited on all aspects of biological, pharmaceutical, biotechnological, and medical applications of fullerenes, metallofullerenes, carbon nanotubes, graphene, and related nanocarbons.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Tatiana DaRos**, Univ. of Trieste, email: daros@units.it; **Hugh De Long**, AFOSR, email: hugh.delong@us.af.mil; **Raluca Van Staden**, National Institute of Research for Electrochemistry and Condensed Matter, email: iustinavanstaden@yahoo.com; **Lon Wilson**, Rice University, email: durango@rice.edu; **Daniel Heller**, Memorial Sloan-Kettering Cancer Center, email: hellerd@mskcc.org; and **Graham Cheek**, US Naval Academy, cheek@usna.edu.

B03

Carbon Nanotubes - From Fundamentals to Devices

Nanocarbons Division / Dielectric Science and Technology Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Papers are solicited on experimental and theoretical studies related to the basic chemistry, physics, and materials science of carbon nanotubes, as well as on novel nanotube applications in areas such as electronic devices, sensors, and materials development.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Slava V. Rotkin**, Lehigh University, email: rotkin@lehigh.edu; **Steven Doorn**, Los Alamos National Laboratory, email: skdoorn@lanl.gov; **Yury Gogotsi**, Drexel University, email: yg36@drexel.edu; **R. Bruce Weisman**, Rice University, email: weisman@rice.edu; **Ming Zheng**, NIST, email: ming.zheng@nist.gov; and **Pawel Kulesza**, University of Warsaw, pkulesza@chem.uw.edu.pl.

B04

Endofullerenes and Carbon Nanocapsules

Nanocarbons Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Original papers are solicited on all aspects of endofullerenes, including endohedral metallofullerenes, endohedral rare-gas fullerenes, and related species. Papers on carbon nanocapsules and metal encapsulates are also welcome. Topics include the synthesis, characterization, properties, and applications of various endonanocarbons.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Takeshi Akasaka**, University of Tsukuba, email: akasaka@tara.tsukuba.ac.jp; **Luis Echegoyen**, University of Texas, El Paso, email: echegoyen@utep.edu; and **Shangfeng Yang**, University of Science and Technology of China, email: sfyang@ustc.edu.cn.

B05

Fullerenes - Chemical Functionalization, Electron Transfer, and Theory: In Honor of Professor Shunichi Fukuzumi

Nanocarbons Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Papers are invited in the following areas of fullerene science: chemical functionalization, electrochemistry, photochemistry, photophysics, electron transfer chemistry, photoelectrochemistry, photovoltaic applications, catalysis, sensor studies, and theoretical studies.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Francis D’Souza**, Univ. of North Texas, email: Francis.D’Souza@unt.edu; **Nazario Martin**, Univ. Complutense de Madrid, email: nazmar@quim.ucm.es; **Dirk Guldi**, Univ. of Erlangen, email: guldi@chemie.uni-erlangen.de; and **David Cliffel**, Vanderbilt University, email: d.cliffel@vanderbilt.edu.

B06

Graphene and Beyond: 2D Materials

Nanocarbons Division / Dielectric Science and Technology Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium focuses on the synthesis, functionalization, characterization, and chemical and physical properties of graphene and graphene-related two-dimensional nanostructures. Papers dealing



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with optical, electrical, chemical, and electrochemical properties of such nanostructures and their composites are welcomed.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Haim Grebel**, New Jersey Inst. of Technology, email: grebel@njit.edu; **Y. Obeng**, NIST, email: yaw.obeng@nist.gov; **Richard Martel**, Univ. of Montreal, email: r.martel@umontreal.ca; **Andreas Hirsch**, Univ. of Erlangen, email: andreas.hirsch@chemie.uni-erlangen.de; **Michael Arnold**, University of Wisconsin, email: msarnold@wisc.edu; and **Vito Di Noto**, University of Padova, email: vito.dinoto@unipd.it.

B07

Inorganic/Organic Nanohybrids for Energy Conversion

Nanocarbons Division / Battery Division / Energy Technology Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Metal and semiconductor nanoparticles play important roles in fuel cells, solar energy conversion, catalysis, and hydrogen production. Recent advances in the area of nanostructured materials have led to new understanding of the catalytic and photoelectrochemical properties of these nanostructures. Optically functional nanostructures, which can collect and localize photon energy into an ultra-small space, can efficiently excite molecules using an extremely low number of photons. Papers are invited in the following areas: synthesis and characterization of metal nanoparticles and nanostructures; functionalization with chromophores, strong photon-molecule coupling fields for chemical reactions, bimetallic particle and semiconductor metal composites; size-dependent catalytic properties; hydrogen evolution reactions; photochemical solar cells; and photocatalysis and electron transfer processes that are relevant to energy conversions.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Hiroshi Imahori**, Kyoto University, email: imahori@kyoto-u.ac.jp; **Huyen Dinh**, NREL, email: huyen.dinh@nrel.gov; **Shirley Meng**, UC San Diego, email: shmeng@ucsd.edu; **Pawel J. Kulesza**, University of Warsaw, email: pkulesza@chem.uw.edu.pl; and **Prashant Kamat**, University of Notre Dame, email: pkamat@nd.edu.

B08

Porphyrins, Phthalocyanines, and Supramolecular Assemblies

Nanocarbons Division / Physical and Analytical Electrochemistry Division / Energy Technology

Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will highlight recent advances in porphyrin chemistry. A wide range of topics will be covered in order to generate interdisciplinary discussions between participants and encourage the

exchange of new ideas. We therefore solicit high quality contributions in areas ranging from the synthesis of challenging porphyrinic devices to the characterization of electrochemical and physicochemical behavior of new porphyrinic materials. Submissions are encouraged on the following topics: (1) new challenging multiporphyrinic devices; (2) electronic properties of porphyrinic arrays; (3) photoinduced processes in molecular and supramolecular porphyrinic assemblies; and (4) novel porphyrin-modified electrodes.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Karl Kadish**, University of Houston, email: kkadish@uh.edu; **Sanjeev Mukerjee**, Northeastern University, email: s.mukerjee@neu.edu; **Nathalie Sollandie**, LCC CNRS Toulouse, email: nathalie.sollandie@lcc-toulouse.fr; **Roberto Paolesse**, Univ. of Rome, email: Roberto.paolesse@uniroma2.it; and **Tomas Torres**, Univ. Autonoma Madrid, email: tomas.torres@uam.es.

C—Corrosion Science and Technology

C01

Corrosion General Session

Corrosion Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Oral and poster presentations concerning all aspects of corrosion and associated phenomena in liquid and gaseous phases are welcome. Theoretical analyses, experimental investigations, descriptions of new techniques for the study of corrosion, and analyses of corrosion products and films are of interest.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **Rudolph G. Buchheit**, The Ohio State University, email: buchheit.8@osu.edu.

C02

High Temperature Corrosion and Materials Chemistry 11

High Temperature Materials Division / Corrosion Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will focus on the fundamental thermodynamic and kinetic aspects of high temperature oxidation and corrosion, as well as other chemical reactions involving inorganic materials at high temperatures. Both theoretical and experimental papers are encouraged. Specifically, contributions on the following topics in the area of oxidation/corrosion are solicited: (1) fundamental mechanisms of high temperature oxidation, (2) reactions in complex environments and/or ultra-high temperatures (>1500°C), and (3) response of protective coatings in high temperature environments. In the area of high temperature chemistry, papers on the following



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topics are solicited: (4) thermodynamic property determination, (5) phase equilibria and phase transformations, (6) solid state diffusion, and (7) volatilization reactions.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **E. Opila**, University of Virginia, opila@virginia.edu; **J. Fergus**, Auburn University, ferguje@auburn.edu; **P. Gannon**, Montana State University, pgannon@coe.montana.edu; **T. Markus**, Institute for Energy Research (IEF-2), T.Markus@fz-juelich.de; **T. Maruyama**, Tokyo Institute of Technology, maruyama@mtl.titech.ac.jp; and **E. Wuchina**, Naval Surface Warfare Center, eric.wuchina@navy.mil.

D—Electrochemical/Electroless Deposition

D01 Dielectrics for Interconnect, Interposers and Packaging 2

Dielectric Science and Technology Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Low dielectric constant materials have been critical to reducing the RC time constant for interconnect on-chip, on-interposers, and in electronic packages and boards. The ITRS calls for dramatic improvements in dielectric constant (both permittivity and loss) and other physical properties, such as thermal expansion, thermal conductivity and modulus, at all levels of interconnect including chips, interposers, packages, and substrates. This symposium will focus on advances in dielectric materials, processing, characterization, and reliability for interconnect dielectrics. The application areas include (1) on-chip; (2) organic, silicon, and glass interposers, (3) package substrates; (4) printed circuit boards; and (5) other interconnect media. The topics include new dielectric materials, patterning methods for dielectric materials, chemical/mechanical/electrical properties and their characterization, applications of dielectric materials in microelectronic devices, and reliability of dielectric materials.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **P. Kohl**, Georgia Tech, email: paul.kohl@chbe.gatech.edu; **O. Leonte**, Berkeley Polymer Technology, email: odleonte@comcast.net; **Kalpathy Sundaram**, University of Central Florida, email: kalpathy.sundaram@ucf.edu; and **Charles Arvin**, IBM, email: Charlesa@us.ibm.com.

E—Electrochemical Engineering

E01 Metallization of Flexible Electronics

Electrodeposition Division / Electronics and Photonics Division / Solvay Specialty Polymers

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Electronic systems on flexible substrates have received increasing attention in the last couple of decades because they enable classes of applications that lie outside of those easily addressed with wafer-based electronics. Two basic approaches are employed to make flexible electronics: (1) transfer and bonding of completed circuits to a flexible substrate, and (2) fabrication of the circuits directly on the flexible substrates. The aim of this symposium is to bring together scientists, researchers, and engineers in order to review and discuss the latest developments and to suggest possible future directions in the area of electrochemical metallization for the emerging field of flexible, printed, and organic electronics manufacturing, including solar, solid state lighting, smart sensors and skins, as well as flexible displays, energy storage, and biomedical devices. Topics of interest include, but are not limited to: (1) Electroless metallization of non-conductive flexible surfaces; (2) Electrochemical deposition of flexible conductors and functional films; (3) Solution based deposition of transparent conductive oxides; (4) Plating processes for backplane electronics and frontplane technologies; (5) Substrates and thin-film barrier plating for flexible devices; (6) Integration of inkjet printing technology with electrochemical metallization; (7) Site-selective metallization of flexible substrates; and (8) Electrochemical metallization for roll-to-roll processing. Materials of interest include thin or thick conductive and metallic films on flexible substrates and integration of 3D metallic interconnects.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Luca Magagnin**, Politecnico di Milano, e-mail: luca.magagnin@polimi.it, **Yosi Shacham-Diamand**, Tel Aviv University, e-mail: yosish@eng.tau.ac.il, **Takayuki Homma**, Waseda University, e-mail: t.homma@waseda.jp; **Andrew Hoff**, University of South Florida, e-mail: hoff@usf.edu; **Paula Cojocar**, Solvay Specialty Polymers, e-mail: paula.cojocar@solvay.com **Vincenzo Arcella**, Solvay Specialty Polymers, e-mail: vincenzo.arcella@solvay.com; and **Giovanni Zangari**, University of Virginia, e-mail: gz3e@virginia.edu.

E02 Surfactant and Additive Effects on Thin Film Deposition, Dissolution, and Particle Growth

Electrodeposition Division / Battery Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.



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The influence of surfactants on the morphology and structure of materials produced by either physical or chemical means is of central importance to several evolving technologies ranging from nanoparticle synthesis by redox reactions to electroplating thin functional films to reversible battery reactions. This symposium seeks to bring together researchers interested in exploring the synergies between adsorbate effects observed during particle and thin film growth and dissolution by electrolytic, chemical reduction, CVD, ALD, or PVD methods. In the last decade significant capabilities for investigating the potential dependent structure and dynamics of adsorbates on single crystal surface have been established. Likewise, the impact of adsorbed anions, cations, upd metal species, and/or molecules on the production of metal and semiconductor films and particles has been widely reported. Taking advantage of this diverse background we will explore several questions of common interest such as: (1) What is the correlation between adsorbate structure and particle shape or facet geometry? (2) What is the extent of rate differentiation accessible by using different surfactants? (3) How much anisotropy can be induced in the electrocrystallization reaction by using different adsorbates? (4) How does potential perturbation affect the adsorbate structure and consequently impact the film growth dynamics? (5) How is particle growth influenced by the choice of reducing agent and surfactant(s), and how does this compare to electrolytic growth at comparable potentials? (6) How is roughness evolution influenced by surfactants? (7) How effectively do surfactants remain segregated at growing interfaces? (8) Why do some surfactants or additives lead to the breakdown of epitaxial growth and become incorporated in the growing solid? (9) How do surfactants influence the deposition of alloys and compounds? (10) Can dendritic growth be tamed by additives? New experimental approaches for studying surfactant and additive effects are also of interest. For example, contributions describing the use of contact printing and related nontraditional patterning methods for fabricating interesting geometries as well as exploring combinatorial measurements are encouraged.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Thomas P. Moffat**, NIST, e-mail: thomas.moffat@nist.gov; **Rohan Akolkar**, Case Western Reserve University, email: ra3@case.edu; **Qiang Huang**, IBM Research, Yorktown Heights, email: qhuang@us.ibm.com; and **Jason G. Zhang**, Pacific Northwest National Laboratory, email: jiguang.zhang@pnnl.gov.

F—Electrochemical Engineering

F01

Alkaline Electrolyzers

Industrial Electrochemistry and Electrochemical Engineering Division / Energy Technology Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Alkaline electrolyzers may offer significantly improved performance over those using acid electrolytes. Non-precious metal catalysts have sufficient stability to be used in alkaline media, leading to lower system cost. This symposium covers all aspects of alkaline

electrolyzers (water, ammonia, urea, and alcohol electrolyzers). Topics of interest include, but are not limited to: (1) electrocatalysts and fundamental mechanistic aspects of redox processes; (2) alkaline electrolytes (liquid alkaline electrolytes, anion conducting membranes); (3) advanced electrode materials and structures; (4) cell and system design, including reactant and product flow, heat transfer, and stack level materials corrosion; (5) electrochemical performance and cell characterization; (6) modeling and simulation of electrochemical phenomena and processes; and (7) applications.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Gerardine Botte**, Ohio University, email: botte@ohio.edu; **Vijay Ramani**, Illinois Institute of Technology, email: ramani@iit.edu; and **Kathy Ayers**, Proton On Site, email: KAyers@protononsite.com.

F02

Electrochemical Engineering General Session

Industrial Electrochemistry and Electrochemical Engineering Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Papers are solicited in areas of industrial electrochemistry and electrochemical engineering that are not covered by other symposia at this meeting. Of particular interest are papers concerning: design, operation, testing, and/or modeling of industrial electrochemical systems; electrochemical waste treatment technologies; methods for electrosynthesis; electrolytic recovery of process materials; new electrode materials; new electrochemical cell designs; and electrocatalysis. Presentations on industrially significant areas, such as chlor-alkali and fluorine production; manufacture of aluminum and other metals; the use of electrochemical methods in pulp and paper bleaching; and generation of environmentally-friendly bleaching chemicals and other active oxidants are also encouraged. Papers may contain both theoretical and experimental work, and papers dealing with either area will be considered.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Vijay Ramani**, Illinois Institute of Technology, email: ramani@iit.edu; **Venkat Subramanian**, Washington University in St. Louis, email: vsubramanian@wustl.edu; and **EJ Taylor**, Faraday Technology Inc, email: jenningsstaylor@faradaytechnology.com.

F03

Electrochemistry in Mineral and Metal Processing

Industrial Electrochemistry and Electrochemical Engineering Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

World supplies of crucial rare earth metals are becoming more restricted as major suppliers want to control their limited natural resources. Due to this reason many countries are restarting old mines and looking for new local resources. This symposium solicits



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contributions on existing and new electrochemical processes and technologies that could be used to recover these rare earth metals such as high temperature molten salts or metal oxides processes.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Trung Nguyen**, University of Kansas, email: cptvn@ku.edu; and **Sudipta Seal**, University of Central Florida, email: Sudipta.Seal@ucf.edu.

F04

High Rate Metal Dissolution Processes 2 Industrial Electrochemistry and Electrochemical Engineering Division / Corrosion Division / Electrodeposition Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than **June 6, 2015**. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

As part of the 188th ECS Meeting, a symposium on High Rate Metal Dissolution Processes was held October 11-12, 1995 in Chicago, IL. The symposium was well attended and it is fitting that a similar symposium be held at the 227th ECS Meeting in Chicago. High rate metal dissolution processes are widely employed in the aerospace, medical, energy, automotive, electronics, and other industries for manufacturing operations ranging from machining and shaping of large parts to micro fabrication of complicated features for small devices. These processes include electrochemical polishing, electrochemical through-mask etching, chemical through-mask etching, electrochemical deburring, electrochemical radiusing, and electrochemical machining. Due to the non-contact nature of these processes, the metal surfaces are not subjected to mechanical and/or thermal damage. Consequently, these processes will continue to play an ever increasing role in surface finishing of advanced metallic components with complex geometries. In addition to invited contributions, contributions are solicited in the areas of (1) Electrodissolution fundamentals; (2) Localized dissolution; (3) Chemical etching; (4) Microfabrication, machining, finishing; and (5) Environmental issues, electrolyte maintenance, recovery of metals, and minimization of water usage. Materials of interest include but are not limited to steels, nickel alloys, titanium alloys, titanium, niobium, molybdenum, tantalum, and other materials of industrial importance. Finally, papers are solicited relating to surface finishing applications for parts fabricated using 3D additive manufacturing processes such as direct metal laser sintering (DMLS) and electron beam melting (EBM).

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **EJ Taylor**, Faraday Technology Inc, email: jenningtaylor@faradaytechnology.com; **Stojan Djokic**, Elchem Consulting Ltd, email: stdjokic@telus.net; and **Doug Hansen**, University of Dayton Research Institute, email: douglas.hansen@udri.udayton.edu.

G—Electronic Materials and Processing

G01

Organic Semiconductor Materials, Devices, and Processing 5

Electronics and Photonics Division / Dielectric
Science and Technology Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than **June 6, 2015**. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This is the fifth symposium in this series and the objective is to link processing and materials studies to devices and technological applications. The symposium will cover a wide range of topics related to broadly understood science and technology of organic/polymeric semiconductor materials, processes, devices and applications. The list of topics of interests includes, but is not limited to, the following: (1) Chemistry of organic semiconductors and its impact on material and device characteristics; organic and polymer semiconductors; (2) Physical phenomena underlying operation of organic/polymeric semiconductor devices; (3) Deposition methods: PVD, solution processing, printing and others; (4) Substrates: conductive and non-conductive, mechanically rigid and flexible; (5) Electronic devices: TFTs; ohmic contacts, dielectric-organic semiconductor material systems, charge transport, modeling; (6) Photonic devices: light emitting diodes and solar cells; (7) Display and lighting applications; (8) Patterning of organic semiconductors to create desired device geometries; (9) Large area organic semiconductor electronics and photonics, roll-to-roll processing; and (10) Reliability, stability, and reproducibility of device characteristics. To be considered for inclusion into the symposium program, a one-page abstract must be submitted electronically to ECS by the posted deadline. A copy of the abstract must also be submitted to the lead symposium organizer Prof. Jamal Deen, and be accompanied by a cover letter with full contact details of the presenting author. This abstract should clearly indicate the purpose of the work, the approach, the manner and the degree to which the work advances the field, and specific results and their significance.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **M. J. Deen**, McMaster University, email: jamal@mcmaster.ca; **D. Gundlach**, National Institute of Standards and Technology, email: David.Gundlach@NIST.gov; **B. Iniguez**, University Rovari i Virgili, email: benjamin.iniguez@urv.cat; and **H. Klauk**, Max Planck Institute for Solid State Research, email: H.Klauk@fkf.mpg.de.



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GO2

Processes at the Semiconductor Solution Interface 6

Electronics and Photonics Division /
Dielectric Science and Technology Division /
Electrodeposition Division / Energy Technology Division /
Physical and Analytical Electrochemistry Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will address the most recent developments in processes at the semiconductor/solution interface including etching, oxidation, passivation, film growth, electrochemical and photoelectrochemical processes, electrochemical surface science, electroluminescence, photoluminescence, surface texturing, and compound semiconductor electrodeposition, for photovoltaics, energy conversion, and related topics. It will include both invited and contributed papers on both fundamental and applied topics of both bulk and nanoscale materials. The following areas are of particular interest: (1) Chemical, electrochemical, and photoelectrochemical etching and surface texturing of III-V and II-VI semiconductors; (2) Surface film growth, multilayer deposition, and surface passivation; (3) Porous semiconductor formation; (4) Electroanalytical measurements on both elemental and compound semiconductors including silicon, germanium, both bulk and epitaxial II-VI, III-V, IV-IV and organic materials in aqueous and non-aqueous electrolytes; (5) Electronic and optical processes at the semiconductor/solution interface; (6) Electroluminescence at the semiconductor/solution interface; (7) Photoluminescence spectroscopy including *in situ* potential-dependent measurements; (8) Electrochemical impedance spectroscopy and investigations of flat-band potential; (9) Combined electrochemical and surface analytical and spectroscopic measurements; (10) Microscopic and surface analytical measurements on chemically and electrochemically modified semiconductor surfaces; (11) Chemical, electrochemical, and photoelectrochemical techniques of device processing including etching, passivation, oxide growth, and metallization; (12) Electrochemical techniques of semiconductor characterization; (13) Nanoscale electrochemical devices; and (14) Electrochemical analytical techniques for semiconductor analysis and processing.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Colm O'Dwyer**, University College Cork, email: c.odwyer@ucc.ie; **D. Noel Buckley**, University of Limerick, email: noel.buckley@ul.ie; **Arnaud Etcheberry**, IREM, Institut Lavoisier, email: etcheber@chimie.uvsq.fr; **Andrew C. Hillier**, Iowa State University, email: hillier@iastate.edu; **Robert P. Lynch**, University of Limerick, email: robert.lynch@ul.ie; **Philippe Vereecken**, IMEC, Belgium, email: Philippe.Vereecken@imec.be; **Heli Wang**, NREL, email: Heli.wang@nrel.gov; and **Oana Leonte**, Berkeley Polymer Technology, email: odleonte@comcast.net.

H—Electronic and Photonic Devices and Systems

HO1

Advanced CMOS-Compatible Semiconductor Devices 17

Electronics and Photonics Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

The scope of this expected new symposium includes: (1) More-than-Moore technology contributing to the semiconductor industry, including: (a) CMOS compatible device, circuits and applications not limited to SOI, scaled devices, and simulations, junctionless FET, multi-gate devices (double gate, FinFET, triple gate, nanowire), high-power devices, semiconductor sensors, TFET devices, and memory devices; (b) device physics and process technology using new materials/noise issues of devices and circuits; (c) Space applications including low-temperature electronics and radiation hardness. (2) More-than-Moore technology, including (a) new MEMS applications, and (b) carbon-nanotube device applications.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Y. Omura**, Kansai University, email: omuray@kansai-u.ac.jp; **J. A. Martino**, University of Sao Paulo, email: martino@lsi.usp.br; **J.-P. Raskin**, Université Catholique de Louvain, email: jean-pierre.raskin@uclouvain.be; **S. Selberherr**, Technische Universität Wien, email: Selberherr@TUWien.ac.at; **H. Ishii**, Toyohashi University of Technology, email: ishii@ee.tut.ac.jp; **Francisco Gamiz**, University of Granada, email: fgamiz@ugr.es; and **B.-Y. Nguyen**, SOITEC/USA, email: Bich-yen.Nguyen@soitec.com.

HO2

Emerging Materials for Post CMOS Devices and Applications 7

Dielectric Science and Technology Division /
Nanocarbons Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

The seventh edition of this highly successful symposium will focus on science, technologies, and applications related to new emerging materials that can be applied to enhance the performance of CMOS, nano-structures or post-CMOS devices. After a one-year break, the symposium will expand to include transition metal dichalcogenide (TMD) (such as MoX₂, WX₂ etc.), IV/III-V based nanowires and TFET device performance, spintronics for next generation devices, as well as keeping its previous theme on graphene and CNT based device enhancement for post-CMOS applications. Special emphasis will be placed on “Beyond CMOS” integration schemes/technology development and on the impact of non-traditional materials such as optical, laser, RF, and other non-conventional devices into nanoelectronics. This symposium accepts papers dealing



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with material synthesis, physical and electrical characterization, and modeling of both material properties and device concepts. Papers will be solicited in the following areas:

Two-Dimensional (2-D) Materials and their Applications: (1.1.) Graphene and CNT based applications and device characterizations: carbon-based devices and integration to RF applications and novel device concept, and transport and mobility enhancement related to electronic, photonic, and other transport mechanism in different devices; thermal behavior of CNT, graphene, and carbon-based devices including thermal transport, thermal conductivity, and heat transfer management in devices and nanostructures or backend interconnect applications. (1.2.) Transition metal dichalcogenide (TMD): synthesis, characterization, and application of new emerging 2D materials such as MoS₂, MoTe₂, MoSe₂, WS₂, WSe₂, boron nitride, etc. for post-CMOS devices. (2) Gr IV and III-V based FinFET, nanowires and TFET applications and characterization: Si, Ge, arsenide and antimonide materials applicable to PMOS and NMOS mobility enhancement III-V heterostructures on Si substrates. Special emphasis will be on nanowires and TFET devices and characterization for low power application and devices. (3) Advanced materials for charge and non-charge based device application: spintronics, novel device structures, and resistance change materials for post-CMOS applications encompassing logic, memory, or optical applications.

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to symposium organizers: **Z. Karim**, AIXTRON, email: z.karim@aixtron.com, **S. De Gendt**, imec, Stefan.DeGendt@imec.be, **Y. Obeng**, NIST, e-mail: yaw.obeng@nist.gov, **D. Misra**, New Jersey Institute of Technology, e-mail: dmisra@njit.edu, and **P. Srinivasan**, Global Foundries, purushothaman.srinivasan@globalfoundries.com.

H03

Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits and Emerging Applications 5

Electronics and Photonics Division / Dielectric Science and Technology Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015.

This symposium will focus on emerging materials, processes, and technologies that can be applied to large area silicon wafers either to enhance the performance of analog and digital integrated circuits or to enable revolutionary device structures with entirely new functionalities. Topics of particular interest include: (1) Materials and processes needed to realize advanced transistor structures with high mobility channels based on either strain engineering or emerging high-mobility channel materials such as strained Si, compound semiconductors and graphene that can be synthesized on large area silicon wafers by epitaxial or other innovative methods. Papers focusing on synthesis of the new channel materials as well as processes that are essential for the realization of successful device structures are of particular interest. Examples include high performance gate stacks and low-resistivity junctions and contacts formed on new, silicon compatible materials. The symposium also invites abstracts on new materials and processes for 3D (TSV) integration; (2) Synthesis of nano-structures including wires, pores and membranes of silicon compatible materials as well as novel MEMS/NEMS structures and their integration with the mainstream

silicon integrated circuit technology. Abstracts on applications of these new devices in all relevant fields including electronics, optics and biology are welcome; and (3) New technologies and equipment for synthesis and characterization of the materials and processes listed above.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **F. Roozeboom**, Eindhoven University of Technology, email: f.roozeboom@tue.nl; **E. P. Gusev**, Qualcomm MEMS Technologies, email: gusev@qualcomm.com; **H. Iwai**, Tokyo Institute of Technology, email: iwai@ae.titech.ac.jp; **K. Kakushima**, Tokyo Institute of Technology, email: kakushima@ep.titech.ac.jp; **D.-L. Kwong**, Institute of Microelectronics, email: kwongdl@ime.a-star.edu.sg; **V. Narayanan**, IBM T. J. Watson Research Center, email: vijayna@us.ibm.com; and **P. J. Timans**, Mattson Technology Inc., email: Paul.Timans@mattson.com.

H04

State-of-the-Art Program on Compound Semiconductors 57 (SOTAPOCS 57)

Electronics and Photonics Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015.

Compound and wide bandgap semiconductors are a significant enabler of numerous optoelectronic, high-speed, power, and sensor electronic materials, devices, and systems. The SOTAPOCS 57 symposium will address the most recent developments in inorganic compound and wide bandgap semiconductor technology, including traditional III-V materials, III-nitrides, II-VI materials, silicon carbide, diamond, and other emerging materials. Papers on both practical and fundamental issues, and new nanoscale investigations and application of compound semiconductor nanomaterials are solicited. The following areas are of particular interest: (1) Advances in bulk, epitaxial and nanoscale growth technologies; (2) Advances in device processing; (3) Novel electronic, optoelectronic, and sensor devices; (4) Schottky and ohmic contact technology; (5) Dielectric properties and passivation; (6) Wafer bonding and packaging; (7) *In situ* and *ex situ* process monitoring; (8) Material characterization and wafer level testing and mapping; (9) Process induced defects; (10) Reliability and device degradation mechanisms; (11) Growth and characterization of compound semiconductor nanoscale material and devices; and (12) Compound semiconductor nanodevices.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Yu-Lin Wang**, National Tsing Hua University, email: ylwang@mx.nthu.edu.tw; **Vidhya Chakrapani**, Rensselaer Polytechnic Institute, email: chakrv@rpi.edu; **Travis Anderson**, Naval Research Laboratory, email: travis.anderson@nrl.navy.mil; **John Zavada**, National Science Foundation, email: jzavada@nsf.gov; and **Cammy Abernathy**, University of Florida, email: caber@eng.ufl.edu.



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H05

Wide Bandgap Semiconductor Materials and Devices 16

Electronics and Photonics Division / Dielectric Science and Technology Division / Luminescence and Display Materials Division / Sensor Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015.

This symposium will focus on issues pertinent to the development of wide-bandgap semiconductor materials and devices. All wide-bandgap semiconductor materials are of interest, including III-nitrides, II-oxides, SiC, diamond, II-VI, and emerging materials. The following technical areas are of particular interest: (1) emitters: light emitting diodes, light emitting transistors, laser diodes, displays, and devices for solid state lighting; (2) detectors: including solar cells and avalanche photodiodes; (3) high temperature, high power, and high frequency electronics; (4) sensor applications; (5) substrates for wide bandgap material epitaxy; (6) material characterization: synthesis, defect structure and luminescence; (7) nanoscale wide band gap materials; and (8) transparent conducting oxide films and devices, including ZnO and IGZO thin film transistors. The goal of this symposium is to bring together the wide-bandgap crystal growth, material processing, circuit design, and device application communities to review current issues and present state-of-the-art developments in wide-bandgap semiconductor technology. This symposium will consist of invited and contributed papers and posters.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **SooHwan Jang**, Dankook University, email: jangmountain@dankook.ac.kr; **Krishna Shenai**, Argonne National Laboratory, email: kshenai@anl.gov; **Kailish Mishra**, Sylvania, email: Kailish.Mishra@sylvania.com; **Gary W. Hunter**, NASA Glenn Research Center, email: gary.w.hunter@nasa.gov; **Fan Ren**, University of Florida, email: ren@che.ufl.edu; and **Colm O’Dwyer**, University College Cork, email: c.odwyer@ucc.ie.

I—Fuel Cells, Electrolyzers, and Energy Conversion

I01

Crosscutting Metrics and Benchmarking of Transformational Low-Carbon Energy-Conversion Technologies

Energy Technology Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Transformational energy technologies need an honest discussion of the advantages and disadvantages of the technology paradigms to achieve the ultimate goal of low carbon energy conversion for transportation and stationary applications. These technologies require a coordinated cross-cutting effort to transcend the conventional approaches to convert energy to renewable fuels at large scales in

transportation and stationary applications. For example, electrolyzers and hydrogen fuel cells, with an emphasis on standardization of metrics of these technologies as an imperative to access the economic viability of these approaches.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Huyen Dinh**, NREL, email: Huyen.Dinh@nrel.gov; and **Eric Miller**, DOE, email: Eric.Miller@ee.doe.gov.

I02

Electrochemical Synthesis of Fuels 3

High Temperature Materials Division / Energy Technology Division / Industrial Electrochemistry and Electrochemical Engineering Division / Physical and Analytical Electrochemistry Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Sustainable economic growth and high quality of life require an abundant supply of clean and affordable energy. Future energy sources include solar, wind, and nuclear energy — all of which can produce electricity as the primary form of energy. The conversion of this electrical energy to fuels (e.g. hydrocarbon or hydrogen) using common chemicals such as carbon dioxide and water through electrochemical processes (e.g. electrolysis reactions), provides an opportunity to remove the temporal variation in the energy supply from solar and wind energy. Electrolysis reactions may involve protons, hydroxide, oxide or other ions. This symposium will provide an international forum for the presentation and discussion of the latest developments on electrolysis and related topics. The emphasis of this symposium is on recent advances relevant to the conversion and utilization of CO₂ and/or H₂O for synthesis of fuels and other chemicals. The application of the same cells as fuel cells is of special interest, because reversible cells that may be couple with renewable or nuclear electric power production in order to increase efficiency through energy storage are of particular importance. Papers are solicited on the topics as follows: (1) Materials for solid oxide electrolysis cells (SOECs) and solid oxide fuel cells (SOFCs), including electrolytes, electrodes, seals, and interconnects as well as proton conductor electrolysis cell (PCEC) and fuel cell (PCFC); also contributions about cells with immobilized liquid electrolytes at elevated temperatures are solicited; (2) Electrochemical reactors for synthesis of chemicals and fuels such as ammonia and hydrocarbons; (3) Electrochemical performance and stability of SOECs/SOFCs, PCEC/PCFC, and other relevant cells; (4) Electrocatalytic phenomena in oxygen electrodes and fuel electrodes; (5) Photoelectrochemical approaches for conversion of CO₂ and/or H₂O; (6) Electrochemical and chemical technologies for CO₂ separation; and (7.) Novel materials or concepts for CO₂ conversion and capture

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Xiao-Dong Zhou**, University of South Carolina, e-mail: xiao-dong.zhou@sc.edu; **G. Brisard**, University de Sherbrooke,



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e-mail: gessie.brisard@usherbrooke.ca; **M. Mogensen**, Technical University of Denmark, e-mail: MOMO@dtu.dk; **W. Mustain**, University of Connecticut, e-mail: mustain@enr.uconn.edu; **J. Staser**, university of South Carolina, e-mail: staser.john@gmail.com; **Turgut Gur**, Stanford University, Turgut@standford.edu; and **M. C. Williams**, NETL, e-mail: Mark.Williams@ur.netl.doe.gov.

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Materials for Low Temperature Electrochemical Systems 2

Energy Technology Division / Industrial Electrochemistry and Electrochemical Engineering Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Materials development is critical to the commercialization of electrochemical technologies including batteries, alkaline and proton exchange membrane fuel cells, electrolyzers, and other electrochemical applications/devices. This symposium will focus on both the fundamental and applied aspects of the materials for low temperature electrochemical technologies. Topics of interest include, but are not restricted to: (1) Experimental methods for membrane/ionomer design, synthesis, characterization and evaluation; (2) Modeling for guiding membrane materials development and for the prediction of membrane material properties; (3) Electrocatalysis fundamentals in fuel cells, metal-air batteries and electrolyzers; (4) Electrocatalyst design, synthesis, characterization and performance/durability evaluation; (5) Design, characterization and evaluation of active materials for batteries; and (6) Electrolytes and separators for batteries.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Minhua Shao**, The Hong Kong University of Science and Technology, email: minhua@gmail.com; and **Peter Pintau**, Vanderbilt University, email: pn.pintau@vanderbilt.edu.

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Methane-Based Electrochemical Energy Conversion and Storage

Energy Technology Division / Industrial Electrochemistry and Electrochemical Engineering Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

The recent boom in natural gas production in the United States presents new opportunities for the electrochemical utilization of methane. This symposium will focus electrochemical approaches to energy storage, energy conversion, and hydrogen production based on methane and methane-derived molecules such as methanol, dimethylether, methylformate, etc. Submissions relating to research on materials, processes, modeling, performance evaluation, and design of systems, are invited for oral and poster presentations.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **SR Narayan**, University of Southern California, email: sri.narayan@usc.edu; **Sanjeev Mukerjee**, Northeastern, email: s.mukerjee@neu.edu; and **Gerri Botte**, Ohio University, email: botte@ohio.edu.

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Solid-Gas Electrochemical Interfaces – SGEI 1

High Temperature Materials Division / Energy Technology Division / Physical and Analytical Electrochemistry Division

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Electrochemistry in many solid-state electrochemical processes and devices (such as gas electrolysis, fuel cells, ionic separation membranes, metal-air batteries, and gas sensors) occurs within a localized region near the interface between the reactant gas and one or more solid phases. During the last 10-15 years, it has become increasingly clear that the composition, structure, and/or properties of materials within this localized region deviate substantially from the bulk material(s) comprising the electrocatalyst. Examples include stoichiometry variations in the vicinity of a three-phase boundary (TPB), enhanced activity near solid-solid heterointerfaces, cation segregation associated with surface reconstruction, and cation stratification/interdiffusion or secondary phase precipitation near gas-solid or solid-solid interfaces. Recent advances in both analytical techniques and modeling are beginning to shed new insights into these local variations in structure/composition, and the role they play in governing local rates. These include new *in situ* experimental methods that probe the thermodynamic state of the solid bulk and surface under finite driving force, scanning probe and other methods that can spatially resolve local variations in conductivity, structure, composition, and reaction rates, and modeling methodologies that consider heterogeneity and local properties, including *ab initio* methods that consider variations in structure/composition at surfaces.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Mogens Mogensen**, Technical University of Denmark, email: momo@dtu.dk; **Ellen Ivers-Tiffée**, Karlsruhe Institute of Technology, email: ellen.ivers@kit.edu; **Tatsuya Kawada**, Tohoku University, email: kawada@ee.mech.tohoku.ac.jp; **Stuart Adler**, University of Washington, email: stuardler@uw.edu; **Pawel J. Kulesza**, University of Warsaw, email: pkulesza@chem.uw.edu.pl; and **Sanjeev Mukerjee**, Northeastern University, email: S.Mukerjee@neu.edu.



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106

State of the Art Tutorial on Diagnostics in Low Temperature Fuel Cells

Energy Technology Division / Industrial Electrochemistry and Electrochemical Engineering Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will feature invited talks on a variety of issues related towards advanced diagnostics of fuel-cell components, stacks, and systems. Topics of interest include (1) techniques that explore catalysts and membranes in operando; (2) modeling and diagnostic methods to characterize mass- and heat-transport related phenomena (e.g., waterflooding) in cells and membrane electrode assemblies; (3) *in situ* measurement or visualization (X-ray tomography, neutron scattering, etc.) at the component and/or cell level; (4) advanced *ex situ* characterization methods for fuel-cell components (TEM, STM); (5) AC-impedance methods; and (6) new characterization methods.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Adam Weber**, LBNL, email: azweber@lbl.gov; **Thomas Zawodzinski**, UTK, email: tzawodzi@utk.edu; **Vijay Ramani**, IIT, email: ramani@iit.edu; **Felix Buchi**, PSI, email: felix.buechi@psi.ch; **Deborah Myers**, ANL, email: dmyers@anl.gov; and **Kazuhiko Shinohara**, Nissan, email: k-shino@mail.nissan.co.jp.

K—Organic and Bioelectrochemistry

K01

Mechanistic Organic Electrochemistry

Organic and Biological Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

This symposium will continue the tradition of the ECS spring meeting as the principal venue for presentation of new results in organic electrochemistry, broadly defined. As such, contributions are invited describing new organic electrode reactions, environmentally benign electroorganic processes, novel solvent systems, organometallic electrochemistry, organic electrode applications involving photochemistry, and electrochemistry at surface-modified electrodes. Mechanistic and synthetic organic electrochemistry contributions are also encouraged.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **Dennis Peters**, Indiana University, email: peters@indiana.edu.

K02

Students in Bioelectrochemistry

Organic and Biological Electrochemistry Division / Physical and Analytical Electrochemistry Division / Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

Contributions are sought from students working in the broad, general area of Bioelectrochemistry. Sensing and fundamental electrochemical studies centered on organic molecules of physiological relevance or origin that are early in development or at the application stage are encouraged. Work focusing on a particular facet of a long-term goal is of interest.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Jim Burgess**, CWRU, email: jdb22@po.cwr.edu; **Mekki Bayachou**, Cleveland State University, email: m.bayachou@CSUohio.edu; **Michael Carter**, KWJ Engineering, email: mtcarter62@comcast.net; and **David Cliffel**, Vanderbilt University, d.cliffel@vanderbilt.edu.

K03

Timely Challenges in Electroanalysis

Organic and Biological Electrochemistry Division / Physical and Analytical Electrochemistry Division / Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

Contributions are sought that address barriers in achieving superior clinical electroanalysis. Work that couples analysis and diagnostics with biological control and disease state management is of particular interest. Fundamental studies characterizing electrode-supported structures and their function, ultimately aimed at biological analysis are welcomed. *In vivo* and *in vitro* applications of diagnostic platforms are also encouraged.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Mekki Bayachou**, CSU, email: m.bayachou@csuohio.edu; **Michael Carter**, KWJ Engineering, Inc., email: mtcarter62@comcast.net; **Jim Burgess**, Case Western Reserve University, email: jdb22@case.edu; and **Alanah Fitch**, Loyola University, afitch@luc.edu.



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L—Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry

L01 Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

In the general session, topic areas of other specialized symposia at this meeting are welcome. Contributed papers will be programmed in some related order, depending on the titles and contents of the submitted abstracts.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Pawel J. Kulesza**, University of Warsaw, email: pkulesza@chem.uw.edu.pl; and **Alice Suroviec**, Berry College, email: asuroviec@berry.edu.

L02 Climate Change 5 Physical and Analytical Electrochemistry Division / Energy Technology Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

This symposium targets electrochemical and solid-state research that leads to a better understanding of climate change effects and technologies to mitigate them. The symposium seeks to bring together scientists and engineers from different perspectives to share their research results, concerns, arguments, and solutions regarding this pressing problem. Presentations are solicited that describe relevant research advances in chemical analysis, energy technology, and environmental remediation. Topics of interest include chemical sensing in the environment (e.g. atmosphere, water, or earth), energy scavenging, conversion and storage, fuel and biofuel cells, electrocatalysis, solar energy conversion, electrochemical and photochemical conversion of carbon dioxide and other greenhouse gases, and related topics. Both experimental and theoretical studies are welcome.

Abstracts should be submitted electronically to ECS headquarters and questions should be sent to the symposium organizers, **A. Fitch**, Loyola University Chicago, e-mail: afitch@luc.edu; and **S. Narayan**, USC, e-mail: Sri.narayan@usc.edu.

L03 Computational Electrochemistry Physical and Analytical Electrochemistry Division / Energy Technology Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

The goal of this symposium is to bring together scientists working in diverse areas of computational electrochemistry, in order to stimulate their awareness of common problems and group interests, facilitate exchange of ideas and opinions, and enable global, unifying views on this emerging interdisciplinary branch of electrochemistry and computational science. The symposium will be devoted to all aspects of computer and computational method uses in electrochemistry, including (but not necessarily limited to): quantum chemical and molecular simulations in electrochemistry (*ab initio*, Monte-Carlo, Molecular Dynamics, etc.); digital simulations of electrochemical transport and kinetic/electroanalytical problems (continuum modeling, including PDE/ODE/DAE solving); multi-physics and multi-scale simulations in electrochemistry; computer-aided data analysis in electrochemical kinetics and electroanalysis; engineering simulations and other computations relevant to electrochemical engineering; software, problem-solving environments, expert systems, databases, Web-based programs, grid applications, etc. for electrochemistry.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Stephen Paddison**, UT Knoxville, email: spaddison@utk.edu; and **Scott Calabrese Barton**, Michigan State University, email: scb@msu.edu.

L04 Electrocatalysis 7 Physical and Analytical Electrochemistry Division / Energy Technology Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

This symposium will be focused on all areas of fundamental and applied electrocatalysis, including catalytic systems for electrofuels, solar fuels, fuel cells, and electrolysis. The symposium welcomes papers in both electrocatalysis as kinetics and mechanistic studies and electrocatalysts materials design and synthesis strategies. Topics will include: hydrogen evolution catalysts, oxygen evolution catalysts, carbon dioxide reduction catalysts, photoelectrocatalysts, oxygen reduction reaction catalysts, anodic electrocatalysts, and methods of characterizing electrocatalysts. Topics also include electrocatalysis in confined environments, addressing issues in nano- and micro-electrochemical reactors, and compartmentalized electrochemical systems.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Shelley Minteer**, University of Utah, email: shelleyminteer@gmail.com; **Plamen Atanassov**, University of New Mexico, email: plamen@unm.edu; and **Minhua Shao**, The Hong Kong University of Science and Technology, email: minhua@gmail.com.



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L05

Electrochemistry at Primarily Undergraduate Institutions

Physical and Analytical Electrochemistry Division / Energy Technology Division / Industrial Electrochemistry and Electrochemical Engineering Division / Organic and Biological Electrochemistry Division / Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

While the lion’s share of research is accomplished by graduate students and post-doctoral fellows, there are a number of institutions that are undergraduate-only that are making significant contributions to electrochemistry. These are wonderful opportunities for the students, but certainly present additional challenges to the primary investigator not seen at the more research-focused institutions. This symposium calls not just for research methods and papers from an undergraduate-dominated setting, but also teaching and curriculum ideas for incorporating electrochemistry into undergraduate programs. We look for this symposium to shed some light on what has been accomplished and some thoughts on what may be. Papers on basic and applied research and teaching in all areas of electrochemistry, electrochemical systems, and physics related to solid state and electrochemical science and technology are solicited. The topics will include: (1) Power and energy applications; (2) Corrosion phenomena; (3) Electrochemical synthesis and engineering; (4) Sensors and biosensors; (5) Luminescent processes; (6) Materials and biomaterials; (7) Electron transport and electrochemistry; (8) Biochemical and biomedical applications; and (9) Novel approaches to teaching electrochemistry. Keynote lectures will be presented by invited speakers. A poster session will be planned. Student participation is highly encouraged, and it is anticipated that some funds will be available for student and young scientist support.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **A. Suroviec**, Berry College, email: asuroviec@berry.edu; **D. Fox**, American University, email: Dfox@american.edu; **R. Calhoun**, United States Naval Academy, email: Calhoun@usna.edu; **Jim Burgess**, CWRU, email: jdb33@pw.cwrui.edu; **Michael Carter**, KWJ Engineering, Inc., email: mtcarter62@comcast.net; **Scott Calabrese Barton**, Michigan State University, email: scb@msu.edu; **John Staser**, Ohio University, email: staser@ohio.edu; and **M. Anderson**, Kennesaw, email: Mark_anderson@kennesaw.edu.

L06

Electrochromic and Chromogenic Materials

Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

The symposium will provide an interdisciplinary forum for exchange of ideas and discussion of new results and crucial achievements in the electrochemical science and technology of electrochromic and related materials with respect to understanding their fundamental properties as well as their applications in such devices as windows or displays. Novel materials, devices design,

and modeling will receive special attention. The proposed topics include, but will not be limited to, novel materials for chromogenic applications, new synthetic and fabrication methods, thin-film techniques for preparation of chromogenic devices (sputtering, sol-gel, pulsed laser deposition, electrodeposition, etc.) or combinatorial approach in search for optimization of electrochromic materials. There has been growing recent interest in electrochromic materials capable of changing their optical properties in response to an external electrical charge insertion. Representative examples include self-darkening electrochromic rear view mirrors or roof electrochromic windows installed in cars or photochromic sunglasses. Other applications are also related to the infrared region, and they include thermal control for satellite or IR camouflage. In this symposium, attention will be paid to the architectural glazing and the various aspects of energy savings with use of electrochromic (or more general chromogenic) coatings. Electrochromic materials concern numerous chemical (organic, inorganic or hybrid) systems. In addition to continuing interest in traditional electrochromic materials, there is a need of developing of new materials through doping systems or alternating original synthesis routes. Additional attention will be devoted to designing devices and interfaces and optimization of critical parameters such as durability, stability, and switching times. Transparent electric and ionic conductors will be considered as well. Strong emphasis will be directed toward modeling and the fundamental and applied aspects of fabrication of novel (organic, inorganic, hybrid) polymeric micro- and nanostructures, experimental and theoretical studies of their properties, mechanisms and dynamics of charge propagation and electroactivity, and coloration and bleaching. During symposium we are hoping to outline important directions for the future.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Pawel J. Kulesza**, Department of Chemistry, University of Warsaw, e-mail: pkulesza@chem.uw.edu.pl; **Aline Rougier**, ICMCB, UPR 9048, e-mail: rougier@icmcb-bordeaux.cnrs.fr; **Chunye Xu**, Hefei National Laboratory for Physical Sciences at the Microscale, University of Science and Technology of China, e-mail: chunye@ustc.edu.cn; **Agnieszka Pawlicka**, IQSC, Universidade de Sao Paulo, e-mail: agnieszka@iqsc.usp.br.

L07

Electrogenerated Chemiluminescence

Physical and Analytical Electrochemistry Division / Luminescence and Display Materials Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

In tandem with the first awarding of the new ECS award in honor of Professor Allen J. Bard, a special symposium is planned on electrogenerated chemi-luminescence (ECL), which has been developed mainly by Bard and co-workers through the past 30 years. Fundamental studies of the ECL process, novel ECL probes, and specific applications of ECL to analytical detection methods and bioassays are encouraged.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **David Cliffl**, Vanderbilt University, email: d.cliffl@vanderbilt.edu; and **Robert Calhoun**, United States Naval Academy, email: calhoun@usna.edu.



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L08 Spectroelectrochemistry 3

Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

Spectroelectrochemistry continues to provide new insights into electrochemical systems as investigators find clever new ways to combine spectroscopy with electrochemistry. The symposium will provide an interdisciplinary forum to discuss new techniques and results exploiting spectroscopic techniques for the evaluation of electrode/electrolyte interfaces as well new concepts and methodologies in the field of interfacial spectroelectrochemistry. Papers are solicited in all areas of electrochemical science in which spectroscopy has been used to provide new information. Examples include: (1) new methods of spectroelectrochemistry (novel approaches); (2) novel sampling configurations or applications; (3) new spectral theories; (4) factors that affect sensitivity, S/N; (5) intermediates: stable vs. transient in a spectro-electrochemical experiments; (6) single crystal electrodes (adsorbates and deposits); and (7) various system components, including bulk redox systems, electrolytes, and electrode surfaces.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Andy Hillier**, Iowa State University, email: hillier@iastate.edu; and **Sanjeev Mukerjee**, Northeastern University, email: s.mukerjee@neu.edu.

L09 Oxygen or Hydrogen Evolution Catalysts for Water Electrolysis

Industrial Electrochemistry and Electrochemical Engineering Division / Energy Technology Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

Water electrolysis represents a clean and sustainable approach to producing hydrogen. However, the cost of hydrogen production from this process is still prohibitive due to significant electricity consumption. High-efficient electrocatalysts for either oxygen evolution reaction (OER) and hydrogen evolution reaction (HER) may enable to lower the over-potential of electrochemical reactions so as to improve the overall energy efficiency of water electrolysis. The development of advanced catalysts may also help to reduce the loading of precious metal catalysts or to replace them with non-precious metal catalysts. This symposium seeks novel or advanced water electrolysis catalysts that include but are not limited to the following categories: (1) catalyst supports with extremely high corrosion resistance (>1.5V vs. SHE); (2) OER catalysts for proton exchange membrane (PEM) based electrolysis; (3) OER catalysts for anion exchange membrane (AEM) based electrolysis; (4) HER catalysts for AEM electrolysis; (5) bi-functional ORR/OER catalysts; (6) bi-functional HOR/HER catalysts; (7) electrocatalysts for artificial photosynthesis or photo-electrochemical cells; and (8) others.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Hui Xu**, Giner Inc., email: hxu@ginerinc.com; **Sanjeev Mukerjee**, Northeastern University, email: s.mukerjee@neu.edu; **Vijay Ramani**, Illinois Institute of Technology, email: ramani@iit.edu; **Plamen Atanassov**, University of New Mexico, plamen@unm.edu; and **Pawel Kulesza**, University of Warsaw, pkulesza@chem.uw.edu.pl.

L10 Photocatalysts, Photoelectrochemical Cells and Solar Fuels 5

Energy Technology Division / Physical and Analytical Electrochemistry Division / Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

This symposium will provide an international and interdisciplinary forum to present the latest research on production of fuels (e.g., hydrogen) and conversion CO₂ by utilizing solar energy. Topics of interest include but not limited to: (1) exploring novel methods for production of fuels such as hydrogen, ethanol, and other fuels; (2) conversion of renewable energy resources such as biomass to fuels; (3) capture or conversion of CO₂ to fuels; (4) photocatalytic disinfection and environmental remediation; (5) synthesis and characterization of photocatalysts; (6) exploring new solar energy materials; (7) development of photoelectrochemical cells (PECs); (8) construction of solar thermal panels and solar reactors; (9) simulation and modeling of materials, devices, and systems for solar energy applications; and (10) corrosion and durability of solar energy materials.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Nick Wu**, WVU, email: nick.wu@mail.wvu.edu; **Deryn Chu**, ARL, email: deryn.chu@us.army.mil; **Huyen Dinh**, NREL, email: huyen_dinh@nrel.gov; **Eric Miller**, DOE, email: Eric.Miller@ee.doe.gov; **Ravi Subramaniam**, UNR, email: ravisv@unr.edu; **A. Manivannan**, NETL, email: Ayyakkannu.Manivannan@NETL.DOE.GOV; **PJ Kulesza**, U. Warsaw, email: pkulesza@chem.uw.edu.pl; **Zhigang Zou**, Nanjing U, email: zgzou@nju.edu.cn; **Heli Wang**, NREL, email: Heli.Wang@nrel.gov; and **Jae-Joon Lee**, Konkuk U., email: jaejoonlee@hotmail.com.

L11 Structure and Relaxations in Soft Ion-Conducting Materials

Energy Technology Division / Battery Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

Ionically conducting materials (ICM) are of great importance for the fabrication of portable batteries for electronic devices such as computers, tools, video and still cameras, and for the development of fuel cell and battery-powered electric vehicles, dye-sensitized solar cells, supercapacitors, and sensors. Conductivity in ICMs occurs via a number of different processes. The predominant conductivity processes are attributed to: (a) the charge migration of ions between



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coordination sites in the host materials; and (b) the increase of conductivity due to relaxation phenomena involving the dynamics of the host materials. Ions “hopping” to new chemical environments can lead to successful charge migration only if ion-occupying domains relax via reorganizational processes, which generally are coupled with relaxation events associated with the host matrix. The aim of this symposium is to bring together scientists studying the structure, the thermal and mechanical transitions, and the relaxations in ion conducting materials. In a concise fashion, contributions describing advanced theoretical models, methods, and instruments used to study comprehensively the structure, the thermal and mechanical transitions, and the relaxations in ion conducting materials are highly welcome.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Vito Di Noto**, U. Padova, email: vito.dinoto@unipd.it; **Gao Liu**, Lawrence Berkeley National Laboratory, email: gliu@lbl.gov; and **Kunal Karan**, U. Calgary, email: kkaran@ucalgary.ca.

M—Sensors

MO1

Nano/Biosensors and Actuators

Sensor Division / Physical and Analytical Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will address all aspects of nano/bio sensors and actuators with at least one dimension in the nanometer range (1 nm = 1 x 10⁻⁹ m). Nanomaterials have structural features and properties in between those of single atoms/molecules and continuous bulk materials. The nanoscale dimensions of nanomaterials bring optical, electronic, magnetic, catalytic, and other properties that are distinct from those of atoms/molecules or bulk materials. In order to exploit the special properties that arise due to the nanoscale dimensions, researchers must control and manipulate the size, shape, and surface functional groups of nanomaterials and structure them into periodically-ordered assemblies to create new products, devices, and technologies or improve existing ones. Papers are solicited, but not limited to the following topical areas: (1) nanostructure technology research for the development of improved bio sensors for applications in medicine, food, agriculture, industry, and environmental monitoring; (2) polymer nano/micro technology in various fields of application; (3) nano/biosensors that are used as novel tools for the analysis of genetic structures and their influence on cellular functions; and (4) nano/biosensors and actuators that augment drug discovery with diagnostics that could eventually allow widespread production of individually tailored patient-specific treatments and therapies.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Aleksandr Simonian**, Auburn University, email: simonal@auburn.edu; **Bryan Chin**, Auburn University, email: chinbry@auburn.edu; **Nick Wu**, West Virginia University, email: Nick.Wu@mail.wvu.edu; **Sushanta Mitra**, University of Alberta, email: Sushanta.Mitra@ualberta.ca; **Larry Nagahara**, NIH National Cancer Institute, email: nagaharal@mail.nih.gov; **David Cliffel**,

Vanderbilt, email: d.cliffel@vanderbilt.edu; **Zoraida Aguilar**, Zystein, LLC, email: zapaguilar@yahoo.com; and **Jessica Koehne**, NASA Ames, email: jessica.e.koehne@nasa.gov.

MO2

Nano-Micro Sensors and Systems in Healthcare and Environmental Monitoring

Sensor Division / Organic and Biological Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will examine progress in the use of microsensors and nanosensors individually and as components of systems, in healthcare, and environmental monitoring applications. The aim of this conference is to bring together medical professionals, clinicians, engineers, chemists, biologists, and physicists under the same roof. This symposium will provide the directions for research, development, and technological evolution, and the discussion of possible standards to be developed in the development of micro-nano sensors and systems in healthcare and environmental monitoring applications. Topics of interest include, but are not limited to: (1) Smart garments for chronic disease management; (2) Drug delivery systems; (3) Nanomedicine; (4) Novel nano-engineered materials; (5) Novel fabrication technologies for micro-nanosystems; (6) Micro-nanosensor-instrumentation interfacing technologies; (7) Microfluidics for sample preparation; (8) Preconcentration techniques to improve limit of detection; (9) Miniature instrumentation including micro-gas chromatography; (10) Self-powered micro-nano systems; (11) Self-cleaning systems and coating for healthcare industry; (12) Micro-nano-sensor systems in measurement, testing and analysis for the water and wastewater and environmental industry; (13) Micro-nano-sensor systems for in situ environmental monitoring; (14) Hybrid materials and nanocomposites for gas sensing; and (15) Micro-nano sensors systems for monitoring gaseous and liquid pollutants.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Ajit Khosla**, B. I. Nanotech/Mobecomm Inc, email: khosla@gmail.com; **Sushanta Mitra**, University of Alberta, email: Sushanta.Mitra@ualberta.ca; **Praveen Sekhar**, Washington State University, email: praveen.sekhar@vancouver.wsu.edu; **Aleksandr Simonian**, Auburn University, email: als@eng.auburn.edu; **Petr Vanýsek**, Northern Illinois University, email: pvanyssek@gmail.com; **Gary Hunter**, NASA Glenn, email: gary.w.hunter@nasa.gov; **Peter Hesketh**, Georgia Institute of Technology, email: peter.hesketh@me.gatech.edu; **Hidemitsu Furukawa**, Yamagata University, email: furukawa@yz.yamagata-u.ac.jp; **Aswini K. Pradhan**, Norfolk State University, email: apradhan@nsu.edu; **Vijay K. Varadan**, University of Arkansas and Penn State, email: vjvesm@uark.edu; **Maria Cristina B. Almonte**, MD, General Malvar Hospital, email: iya.almonte@gmail.com; **Shekhar Bhansali**, Florida International University, email: sbhansa@fiu.edu; **Ash M. Parneswaran**, Simon Fraser University, email: paramesw@sfu.ca; **Mikito Yasuzawa**, The University of Tokushima, email: mik@chem.tokushima-u.ac.jp; **Raluca Van Staden**, Laboratory of Electrochemistry and PATLAB, INCEMC Bucharest, email: iustinavanstaden@yahoo.com; **Sam Kassegne**, MEMS Lab., ME Department, SDSU, email: kassegne@mail.sdsu.edu; **Edward M. Sabolsky**, West Virginia University, email: ed.sabolsky@mail.wvu.edu; **Mekki Bayachou**, Cleveland State University, email: m.bayachou@csuohio.edu; and **Jun-Woo Choi**, Louisiana State University, email: choijw@lsu.edu.



227th ECS Meeting

May 24-28, 2015

Chicago, Illinois, USA

Hilton Chicago



MO3

Sensor Applications of Ionic Liquids

Sensor Division / Physical and Analytical
Electrochemistry Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Ionic liquids have received considerable attention in recent years as new media for performing analytical measurements and for the fabrication of chemical sensors. The vast range of physical and chemical properties of room temperature ionic liquids hold the possibility of significant new sensing capabilities. This symposium will examine recent advances and challenges in the use of room temperature ionic liquids as sensor components. Of particular interest are applications where the ionic liquid component imparts new capabilities to the measurement, which were not achievable using conventional means. All levels of progress toward this goal, as well as all analytical methods, sensing methods, and transduction modes are welcome. The aim of the symposium is to evaluate critically the state-of-the-art in the use of ionic liquids for sensor development and to identify promising paths forward to bring these media into more widespread practical use in the future.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Michael Carter**, KWJ Engineering, Inc., email: mtcarter62@comcast.net; **Luke Haverhals**, Bradley University, email: luke.haverhals@gmail.com; **Gary Hunter**, NASA Glenn, email: gary.w.hunter@nasa.gov; and **Vadim Lvovich**, NASA Glenn, email: vlvovich@ameritech.net.

MO4

Sensors, Actuators, and Microsystems

General Session

Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

This symposium will address all aspects of chemical, biological, and physical sensors, actuators, and microsystems. Chemical, biological, and physical sensors find extensive application in environmental monitoring, health care, food security, industrial quality assurance, safety, and process control. Sensors and actuators are often integrated into “smart” microsystems: microfabricated sensors and/or actuators combined with electronics which enable, for example, signal conditioning and data processing. The need for multifunctional, smart technologies, which depend on sensors, actuators, and electronics, is expected to increase in coming years as further demands and expectations are placed on systems and devices. This general session welcomes papers on all aspects of sensors, actuators, and microsystems not covered in other sessions. This symposium intends to bring together a range of interdisciplinary topics and covers all materials and other aspects of sensors, actuators and microsystems. Primary emphasis will be placed upon applied aspects of the materials, synthesis, evaluation, and development strategies of novel materials/device configurations for sensing and actuating functions as well as integrated microsystems. Papers are solicited in, but not limited to, the following areas: (1) physics

and chemistry of sensor and actuator materials, fabrication, and characterization of novel compositions; (2) novel sensor and actuator concepts, design, modeling, and verification, system integration, and actuating functions; (3) sensing systems that include sampling systems and actuators, like sensor arrays, and electronic noses and tongues; (4) chemical, biological, and physical sensors and actuators based on various transduction mechanisms including electrochemical, resistive, fluorescence, surface plasmon resonance, surface-enhanced Raman scattering, fiber optics, radio frequency, microwave, and surface acoustics; (5) emerging technologies and applications including sensors based on nanotechnology, (6) wireless integrations; and (7) novel techniques to expand and ensure sensor stability and reliability.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Mike Carter**, KWJ Engineering, email: mtcarter62@comcast.net; **Sushanta Mitra**, University of Alberta, email: Sushanta.Mitra@ualberta.ca; **Bryan Chin**, Auburn University, email: chinbry@auburn.edu; **Jing Li**, NASA Ames Research Center, email: jingli@mail.arc.nasa.gov; **Zoraida Aguilar**, Zystein, LLC, email: zapaguilar@yahoo.com; and **Aleksandr Simonian**, Auburn University, email: als@eng.auburn.edu.

Z—General

Z01

General Student Poster Session

All Divisions

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

This poster session provides a forum for graduate and undergraduate students to present research results of general interest to ECS. The purpose of this session is to foster and promote work in both electrochemical and solid-state science and technology, and to stimulate active student interest and participation in ECS. A competition for the two best posters will be part of the session. Cash prizes will be given to the presenting student author on each winning paper; the amounts are awarded at the discretion of the organizers and judges.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Venkat Subramanian**, Washington University in St. Louis, email: vsubramanian@wustl.edu; **Matt Foley**, United States Naval Academy, email: foley@usna.edu; **Vimal Chaitanya**, New Mexico State University, email: vimalc@ad.nmsu.edu; **Ajit Khosla**, Concordia University, email: khosla@gmail.com; **Pallavi Pharkya**, Lam Research Corporation, email: pallavi.pharkya@gmail.com; and **Kalpathy Sundaram**, University of Central Florida, email: Kalpathy.Sundaram@ucf.edu.



227th ECS Meeting

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Z02

Nanotechnology General Session

All Divisions / Interdisciplinary Science and Technology Subcommittee

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

The emergence of nanotechnology as a major field of research has touched almost every scientific discipline. The number of applications for materials that are prepared on a nanometer scale has been expanding rapidly. The advancement of these applications is made possible by the new methods of preparation and characterization of materials and composites on a nanometer scale. Examples include catalysts for fuel cell, battery, and supercapacitor applications, semiconductors for photovoltaic and photoelectrochemical solar energy conversion, and chemical and biological sensors. This symposium will focus on critical issues and state-of-the-art developments in the science and technology of nanostructured materials for a broad spectrum of applications. Papers are solicited in all areas related to materials including metals, ceramics, semiconductors, composites, molecular electronics, and organic compounds and polymers, and to devices including fuel cells, batteries, photovoltaic cells, supercapacitors, molecular/nanoelectronics, chemical and biological sensors, actuators, etc. Areas of interest include: heterogeneous functional materials for energy systems; semiconductor and metal nanoparticles and metal/semiconductor nanocomposites; size quantization effects in semiconductor nanoparticles; fundamentals of nucleation and growth of nanoparticles/nanowires/nanotubes; novel synthesis methods of nanostructured materials; processing of nanostructured materials; advanced characterization techniques for nanostructured materials; modeling and tailoring of nanostructured materials; nanocomposites and interfacial phenomena; photo-induced charge separation and interfacial charge transfer; photoelectrochemistry of nanostructured films; photo-catalysis and environmental applications; nano-ionic; nanostructured catalysts for fuel cells, electrolyzers, batteries, and supercapacitors; nanostructured sensor surfaces; and biological applications of nanomaterials.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: **O. Leonte**, Berkeley Polymer Technology, email: odleonte@comcast.net.

Z03

Solid State Topics General Session

Dielectric Science and Technology Division / Electronics and Photonics Division / Energy Technology Division / Luminescence and Display Materials Division / Nanocarbons Division / Organic and Biological Electrochemistry Division / Sensor Division

A “standard” issue of *ECS Transactions* is planned for this symposium. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than June 6, 2015.

Original papers are solicited on all aspects of electronic materials, devices, and processing technologies not covered by specialized topical symposia at this meeting.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **Kalpathy Sundaram**, University of Central Florida, School of Electrical Engineering and Computer Science, email: sundaram@mail.ucf.edu; **Oana Leonte**, Berkeley Polymer Technology, email: odleonte@comcast.net; **Gary Hunter**, NASA Glenn, email: gary.w.hunter@nasa.gov; **K. Shimamura**, Waseda University, email: shimamura.kiyoshi@nims.go.jp; and **H Iwai**, Tokyo Institute of Technology, email: iwai@ep.titech.ac.jp.

Z04

Nature-Inspired Electrochemical Systems

Energy Technology Division / Organic and Biological Electrochemistry Division / Industrial Electrochemistry and Electrochemical Engineering Division / Physical and Analytical Electrochemistry Division / Sensor Division / Interdisciplinary Science & Technology Subcommittee

An “enhanced” edition of *ECS Transactions* is planned to be available at the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than February 20, 2015. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

In recent years, engineers and scientists have taken inspiration from the natural world to design new materials, algorithms and devices. Several successes have been realized in the fields of mathematics, robotics, polymer synthesis, new heterogeneous catalysts, etc. Some specific examples include the development of advanced algorithms that were able to predict Newton’s laws of motion from experimental data, synthesis of polystyrene in plants, catalyst for solar fuel conversion, and the emergence of microbial fuel cells that have good potential for industrial wastewater treatment applications. However, the realization of similar advances for electrodes, electrolytes, and cell architecture have been slow and a concerted effort in this area has the potential to have a broad societal impact as electrochemical devices are expected play key roles in energy conversion and storage in the 21st century. This symposium will focus on the invention and recent advances in electrochemically relevant materials and systems. Areas of interest include: (1) the use of biological agents to control the growth, size, shape, or function of electrodes or electrolytes; (2) electrodes and electrolytes whose structure or function seek to mimic a naturally-occurring system; (3) devices that utilize electrochemical processes to mimic or re-create a microhabitat or naturally occurring system; (4) *in vivo* or *in vitro* use of electrochemical devices to treat disease or control of cells for disinfection/sterilization; and (5) direct use of biological materials in electrochemical devices as electrodes/electrolytes or promoters of electrochemical processes.

Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizers: **W. Mustain**, University of Connecticut, email: mustain@engr.uconn.edu; **Huyen Dinh**, NREL, email: huyen.dinh@nrel.gov; **Hui Xu**, Giner Inc., email: hxu@ginerinc.com; **Shelley Minteer**, Univ. of Utah, email: minteer@chem.utah.edu; **Aleksandr Simonian**, Auburn University, email: als@eng.auburn.edu; **Mekki Bayachou**, Cleveland State University, email: m.bayachou@csuohio.edu; and **Gerardine Botte**, Ohio University, email: botte@ohio.edu.